APPENDIX B - PROBLEMS & NEEDS DEFINITION

This appendix provides a summary of needs and deficiencies identified in Working Paper #1 (see Volume III). The structure of the summary below provides the reader with a clearer understanding of the transportation system-related problems facing the Central Coast Region. Definitions of the problems and needs are provided below, along with the locations or samples of locations where the problem currently occurs within the region. Based upon information provided in Working Paper #1, fifteen (15) transportation system-related problems were identified. Table B.1 at the end of this appendix provides a brief listing of each problem or need and the associated locations where the problem or need currently exists within the Central Coast Region.

RECURRING CONGESTION

Commuter

Definition:

Commuter-related congestion is defined as the regular occurrence of heavy or significant vehicular travel along specific streets and highways during weekdays, usually occurring during the AM, Mid-day, and PM peak periods. ITS applications focusing on incident detection, weather detection, traveler information, and system management can provide some relief.

Location:

The problems associated with commuter congestion primarily occur within the urbanized areas of the region during the peak commuter periods. The major highways impacted by commuter congestion problems include US 101 around Santa Barbara, SR 1 near Monterey and Santa Cruz, SR 17 in Santa Cruz County, and SR 68 in Monterey County. Commuter or recurring congestion problems also occur on host of minor highways and local arterials.

Recreational

Definition:

Recurring recreational congestion is defined as the regular occurrence of heavy or significant recreation-related vehicular travel along specific streets and highways, usually occurring over weekends. The region generally receives an influx of additional traffic associated with recreational travel, not only on weekends, but also during holidays, and over the summer vacation period. ITS applications focusing on incident detection, weather detection, traveler information, and system management may used to address this issue.

Location:

While congestion due to recreational travel occurs through the region, major highways identified as experiencing significant recreational congestion on a regular basis include US 101, Hwy 1, SR 17, SR 46, SR 68, SR 154, and SR 156. Urban arterials near the recreational destinations may also be impacted by recurring recreational congestion.

Activity Centers

Definition:

Activity centers, including airports, major universities, recreation areas, and other major attractions within the Central Coast region contribute to congestion and related problems during certain time periods. Because many of these activity centers operate year-round and attract both resident and visitor trips, their impact on the transportation system is a regular occurrence. ITS-related applications focusing on advanced signal control, incident detection, weather detection, traveler information, and parking management can be used to address this need.

Location:

Recurring congestion due to a specific activity center is usually focused on the arterials and highways that provide direct access to that facility. Examples include the arterial near the Monterey Aquarium/Cannery Row, and those serving the Santa Cruz Boardwalk.

NON-RECURRING CONGESTION AND INCIDENTS

Definition:

Non-recurring congestion refers to congestion that does not occur on a regular basis and is often the result of unplanned incidents. Sources of non-recurring congestion can include accidents, major disasters such as landslides that close roadways, construction activities, and special events.

Often these events result in significant localized congestion, but may, in some instances, have system-wide impacts. Transportation agencies need to quickly and accurately identify the cause of the non-recurring, and to implement responses that minimize the effects on the motoring public.

Incident management may be supported through the detection and surveillance of conditions, and through the use of advanced communication systems. The application of incident detection and traveler alert or information systems can often reduce the severity of congestion. Applying incident management techniques can also reduce safety problems associated with incidents.

Location:

Incidents can occur throughout the region. In the urbanized or more populous parts of the region, severe localized congestion can occur very quickly when an incident occurs. Often alternative routes of travel can be identified. In rural areas where there may not be a nearby alternative route of travel, incident detection coupled with adequate traveler information at locations where alternative decisions regarding a new route of travel can be made is essential.

SPECIAL EVENT/ACTIVITY CENTER TRAFFIC

Definition:

Special events and activity centers often create unique and irregular travel patterns and traffic conditions. This is a result of the high concentration of trips generated, usually in a focused geographic area and for short periods of time, and the high number of visitors who may be unfamiliar with the transportation system. The need to adequately respond to the traffic impacts caused by special events and activity centers is of concern throughout the Central Coast region. Issues related to special events and activity centers include access guidance, congestion, and parking. Severe congestion on facilities adjacent to a special event/activity center can result from insufficient or poor parking management.

Generally, these events/centers are not equipped to completely handle transportation-related impacts, and rely on various transportation agencies to assist in these efforts. Strategies to aid in these efforts include traveler information services, adaptive signal control systems, and parking management strategies.

Location:

Traffic-related problems associated with special events and activity centers are an issue throughout the Central Coast region. Locations with major special events include Laguna Seca Raceway (various events), Pebble Beach (AT&T National Pro-Am Golf Tournament), Paso

Robles (Mid State Fair), Castroville (Artichoke Festival), and San Luis Obispo (Mardi Gras). Activity centers oriented toward visitors include local beaches, missions, airports, Santa Cruz Boardwalk, Hearst Castle, Big Sur, the Monterey Bay Aquarium, and Stearn's Warf in Santa Barbara. Other special events and activity centers are listed in Appendix B of Working Paper 1. The highways and local roadways in the immediate vicinity of these locations are most directly impacted.

TRANSIT EFFICIENCY AND EFFECTIVENESS

Definition:

Transit efficiency and effectiveness is defined as the need to provide mobility, reduce demand, and improve air quality through the provision of adequate transit services and programs. Although public transit does not carry a large percentage of trips in the communities of the region, it is viewed to be an important part of the overall transportation system. Since there is a region-wide funding shortfall for transit services, ways to improve the efficiency and effectiveness of the existing transit systems are important. AVL systems, electronic fare payment systems (e.g. SMART Cards), transit information systems, advanced vehicle maintenance systems, and automated passenger counting systems are viewed to be desirable, where cost-effective. Increased use of the Internet is envisioned to reduce printed materials costs and optimize staff resources. Each of these applications will also improve the ability of transit providers to effectively manage their transit systems by providing better planning data such as the ability to track transit system trends and ridership, on-time performance and schedule tracking, transit users, performance of mechanical equipment, etc.

Location:

Some form of public transit service is provided within and between most communities and activity centers and special event locations in the Central Coast region. Each of the public transportation agencies throughout the region faces the problem of increasing efficiency while at the same time trying to balance the funding shortfall.

MOBILITY & ACCESSIBILITY

Definition:

Mobility and accessibility is defined as the need to provide improved or additional access and increased mobility through the provision of adequate transit services. One goal of the region's transit systems is to offer the public mobility. This effort is hampered by service shortfalls

throughout the region, especially outside of the more urbanized areas. Increased service coverage, increased frequency, improved Dial-A-Ride services, increased coordination with social service agencies, through automated/electronic billing and record keeping systems, are all areas of potential pursuit.

Location:

Each of the public transportation agencies throughout the region faces increasing demands for greater transit service coverage, frequency and flexibility.

EMERGENCY RESPONSE

Definition:

The effectiveness of emergency response is predicated in the amount of time it takes to respond to an emergency or incident. Population dispersion throughout the region makes timely emergency response difficult. General transportation problems and inadequate communications systems further exacerbate the problem. ITS components that can help improve response time include advanced communications systems, targeted expansion of the call box system, and promotion of "mayday" systems.

Location:

This is a region-wide problem; however, the problem (and potential solutions) may be subdivided into two separate classifications – urban areas and rural areas.

SYSTEM MONITORING

Definition:

Effective management of the transportation system requires accurate and timely information regarding the status and operation of transportation system components. The types of information collected to provide for effective system monitoring include incident detection (including road closures), roadway operating conditions (including congestion), transit operating conditions (vehicle location, schedule adherence), and weather detection (including the presence of fog). This information can help transportation system managers operate the system more effectively and efficiently. Caltrans and the California Highway Patrol view traffic management centers to be at the heart of the California strategy for monitoring and managing traffic, both within and outside major metropolitan areas. The TMC Master Plan identifies current concepts for establishing TMCs throughout the State. A TMC is currently identified for Caltrans District 5, but specific plans need to be shaped by the development of the Central Coast ITS Strategic Plan.

Location:

System monitoring is a need throughout the region. Traffic and transit operations monitoring is most appropriate in the urbanized areas of Santa Cruz, Monterey, San Luis Obispo, and Santa Barbara Counties. In rural areas, incident, road closure, and weather monitoring may be more important. Weather problems occur along SR 1 and SR 46 in Monterey and San Luis Obispo Counties.

TRAVEL INFORMATION NEEDS INCLUDING VISITORS

Definition:

Maximizing the efficient use of the transportation system requires that travelers be informed about travel options and current operating conditions. This is especially important in the Central Coast region because it attracts a significant number of visitors who may not be fully aware of the transportation system along the Central Coast. Tourism is a very important component of the region's economic base. Inefficient use can not only lead to transportation-related impacts such as congestion, unsafe conditions and additional vehicle miles traveled, but may also have economic impacts resulting from inefficient goods movement and unfavorable experiences of visitors. As a result, ITS can help address the needs of the region's tourists through traveler information systems, incident detection, adverse weather detection, and other applications. Travel information includes the provision of Internet services and kiosks at activity centers and major transportation hubs.

Location:

Travel information is a general need throughout the region. It may be particularly important at key route-decision points, such as the US 101 and SR 156 junction, and within the major tourist destination spots such as the Monterey Peninsula. Major routes used by visitors include US 101, SR 1, SR 17, SR 41, SR 46, SR 68, SR 152, and SR 156. Operating condition information is also a need in urbanized areas and along congested corridors.

EFFICIENT NETWORK FOR COMMERCIAL VEHICLES

Definition:

A major industry in each of the counties is agriculture. Major crops grown along the Central Coast include apricots, artichokes, asparagus, avocados, broccoli, brussel sprouts, cauliflower, cherries, flowers, garlic, grapes, lettuce, lemons, onions, strawberries, and tomatoes. Getting these products to market is naturally critical to the industry and the region's economy. In

addition, the efficient transport of retail goods within and through the Central Coast is vital. Thus, it is important that the transportation network be accessible and efficient for commercial operators. The problems of commercial operators include the inefficiency of the truck and load permitting processes, delay associated with weigh stations, delays due to congestion and inefficient routing, and traveler information needs.

Location:

The efficient movement of goods is a regional transportation issue in the Central Coast region. Specific locations where improvements should occur include existing weigh stations, rest stops or areas, and major commercial truck centers located along major routes in the region.

IMPACTS OF COMMERCIAL VEHICLES ON HIGHWAYS

Definition:

A corollary to the above, is the impact that commercial vehicles have on the region's roadway network. Because they are slower-moving and less maneuverable, and simply because of their size, commercial vehicles can contribute to congestion and safety problems. In urban areas, particularly near major loading facilities, commercial vehicles can create unique parking problems. ITS strategies such as travel information, hazard warning and incident detection systems, can not only improve truck operations, but may also provide safety and congestion relief benefits.

Another important issue is the transport of hazardous materials. Petroleum products, fertilizers and insecticides are examples of hazardous materials that must be transported within and through the Central Coast region.

Location:

The movement of goods via commercial vehicles is a regional characteristic. Large volumes of truck traffic impact the major routes throughout the region, including US 101, SR 1, SR 17, and SR 46. Of special concern is heavy duty and agricultural truck travel along streets and highways within the cities of Castroville and Salinas. Streets and roads within these cities are severely impacted by agricultural and other heavy-duty trucks loading agricultural products for delivery within and outside the region.

SAFETY

Definition:

Throughout the region there are transportation safety problems that have proven difficult and costly to address with basic engineering tools. Highway safety along a number of facilities in the region is a significant concern of state, regional, and local agencies. Many safety concerns in the region are related to the design constraints or specific roadways, however other types of safety issues that are of general concern are pedestrian accidents, vehicular accidents at railroad crossings, and driver fatigue. ITS strategies that may address safety concerns include improved traveler information, safety and hazard warning, incident management and emergency response systems, and systems management.

Location:

Specifically, agencies are concerned with street and highway facilities that traverse the Diablo and Coast Ranges such as US 101, SR 17, SR 25, SR 46, SR 41, SR 58, SR 152, SR 156, SR 166, SR 198, and SR 246. Most of these facilities are rural two-lane highways with limited passing opportunities and a significant number of curves with treacherous and steep passages. Other routes along the coastal plain and in the valleys where limited passing is provided such as along SR 1, SR 41, SR 46, and SR 154 are also of concern.

BETTER PLANNING DATA

Definition:

Short- and long-range planning is an important function for most of the region's transportation agencies. To be done effectively, this function requires accurate and comprehensive data on system condition and use. However, collecting this data can be a time-consuming and costly endeavor. Several ITS applications can provide the data needed by planning agencies as an input into the transportation planning process. As an example, Smart Call Boxes can be used to collect traffic volume data. Such data forms the basis for most transportation planning or traffic engineering related work that is undertaken within the region. Another example includes the use of video detection that provides count data such as vehicle occupancy, traffic volume, queue analysis, and speed.

Location:

Better planning data can be used by all agencies within the Central Coast region.

MAINTENANCE ACTIVITIES

Definition:

Funding constraints have reduced the ability of the state and local governments to adequately repair heavily traveled roadways, let alone rural facilities that attract low traffic volumes. The potential payoff in technological applications of highway maintenance could be significant, given that regional budgets for roadway maintenance and rehabilitation in the Central Coast are typically between 30 and 40 percent of projected transportation expenses. Investments in technology to enhance maintenance efficiency could yield substantial cost savings. These investments may also provide safety benefits. One element of Caltrans technology research is directed toward technological developments such as robotics and automation that improve the efficiency and safety of highway maintenance and construction activities. In addition to the technological advancement of maintenance equipment, possible ITS applications in this area include the management of maintenance fleets through AVL systems, and infrastructure inventory and monitoring systems.

Location:

Maintenance will be a continuing problem for all agencies within the Central Coast region.

INTER-AGENCY COMMUNICATION

Definition:

Because transportation-related responsibilities are distributed between several entities, interagency communication and cooperation is critical to the effective management of the transportation system. An effective communications system allows all interested jurisdictions to share important data in a timely manner thereby allowing the personnel to coordinate operations safely and efficiently. To address this issue, the need for the regional standardization of communications protocol that will enhance the ability of agencies communicate and share data is vital. The proposed TMC can facilitate interagency communication by serving central processing point for transportation information.

Location:

Inter-agency communication problems are a concern throughout the region.

ENVIRONMENTAL IMPACTS

Definition:

Sensitivity to the environment is an important factor that shapes all transportation programs within the Central Coast region. There is a general reluctance to move forward with major highway widening projects unless absolutely necessary. This increases the importance of managing the existing infrastructure, with ITS being a potential tool to consider in that management effort. ITS applications that can help reduce prolonged congestion and enhance the use of alternative modes of transportation would, in-turn, help reduce environmental impacts. For example, the continued implementation of signal system optimization using advanced computer and communication technologies can help minimize vehicle delay thereby reducing emissions and noise pollution, and the expanded use of demand-responsive shuttle services by the elderly, handicapped and business/education commuters can help eliminate vehicle trips thus reducing congestion.

Location:

Environmental impacts are a concern throughout the region, but are potentially more significant in urban areas.

Table B.1 - Summary of Needs and Deficiencies

Problem Area/Need	Location
Recurring Congestion A. Commute	Major regional routes include US 101, SR 1, SR 17 and SR 68, plus major urban arterials throughout the region.
B. Recreational	Major routes include US 101, SR 1, SR 17, SR 68, SR 156, as well as the urban arterials near recreational destinations.
C. Activity Centers	Urban and rural areas near activity centers in the region.
Non-Recurring Congestion ▪ Incidents ▪ Major Disasters ▪ Construction ▪ Special Events	Urban and rural areas region-wide and at Special Events region-wide including the Laguna Seca Raceway, AT&T National Pro-Am Golf Tournament, Mid State Fair, Artichoke Festival, Mardi Gras, etc.
Special Event/Activity Center Traffic ▪ Congestion ▪ Parking Management	Special Events include the Laguna Seca Raceway, AT&T National Pro-Am Golf Tournament, Mid State Fair, Artichoke Festival, Mardi Gras, etc. Activity Centers include beaches, missions, airports, Hearst Castle, Big Sur, the Monterey Bay Area Aquarium, Stearn's Warf, etc.
Transit Efficiency and Effectiveness ▪ Service Quality and Reliability ▪ Transit Service Management	Regional. All public transportation services.
Mobility and Accessibility ▪ Transit Service Coverage	Regional. All public transportation services.
Emergency Response	Regional. Can be subdivided into urban areas and rural areas.
System Monitoring ▪ Roadway Closures ▪ Operating Conditions ▪ Weather	Regional. Operating condition problems occur in urbanized areas in Santa Cruz, Monterey, San Luis Obispo, and Santa Barbara Counties. Weather problems occur along SR 1 and SR 46 in Monterey and San Luis Obispo Counties.
Travel Information Needs Including Visitors ▪ Operating Conditions ▪ Travel Services	Regional. Major routes include US 101, SR 1, SR 17, SR 41, SR 46, SR 68, and SR 156. Major tourist destinations including Monterey Peninsula, Big Sur, etc.

Table B.1 - Summary of Needs and Deficiencies

Problem Area/Need	Location
Efficient Network for Commercial Vehicles ▪ Weigh Stations and Permitting ▪ Information	Weight stations, rest stops or areas, and major commercial truck centers located along major routes in the region.
Impacts of Commercial Vehicles on Highways ▪ Safety ▪ Congestion ▪ Hazardous Materials	Regional. Major routes include US 101, SR 1, SR 17, and SR 46, and local streets and roads in the cities of Castroville and Salinas.
Safety ▪ Design Issues ▪ Railroad Crossings ▪ Pedestrian Safety	Regional, including SR 1, SR 17, SR 41, SR 46, SR 58, SR 156, SR 166, SR 198 and SR 246. Other routes where limited passing occurs is along SR 1, SR 41, SR 46, and SR 154. Also at grade railroad crossings and locations with significant pedestrian activity.
Better Planning Data	Regional. Types of data include volume, speed, vehicle classification, etc.
Maintenance Activities	Regional.
Inter-agency Communication	Regional.
Environmental Impacts	Regional.